



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/500,961

07/08/2004

Minoru Ohara

2004-0942A

3412

513 7590 03/30/2009

WENDEROTH, LIND & PONACK, L.L.P.

1030 15th Street, N.W.,

Suite 400 East

Washington, DC 20005-1503

EXAMINER

BAREFORD, KATHERINE A

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

03/30/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |  |                                      |  |
|------------------------------|--|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/500,961     | <b>Applicant(s)</b><br>OHARA, MINORU |  |
|                              | <b>Examiner</b><br>Katherine A. Bareford | <b>Art Unit</b><br>1792              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 73-84 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 73-84 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 19, 2009 has been entered.

The amendment filed with the RCE submission of March 19, 2009 has been received and entered. With the entry of the amendment claims 1-72 have been canceled, and claims 73-84 are pending for examination.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 73-84 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to

one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Independent claims 73 and 79 were amended by the amendment of March 19, 2009 to provide that the pins are formed by filling the cooling holes with liquid elastic body "while adjusting an amount of the liquid elastic body in the cooling holes so that the liquid elastic body is reduced in volume with hardening thereof". The Examiner has reviewed the disclosure as filed, however, the disclosure as filed indicates that during injection of the liquid elastic body into the cooling hole, "injection amount is adjusted so that the masking pin after hardening does not protrude . . ."(page 13, first full paragraph of specification). In the paragraph bridging pages 14-15 of the specification, it is also indicated to adjust the injection amount of the elastic body so that the masking pin does not protrude. In other words, the original disclosure provides that the amount of liquid elastic body in the cooling holes is adjusted during application so that the resulting masking pin does not protrude due to the inherent shrinkage of the elastic material used during hardening. However, the original disclosure does not disclose what applicant actually claims-- that the adjusting of the amount of liquid in the cooling holes results in the liquid elastic body being reduced in volume; because as described there would be some degree of shrinking during hardening for any amount provided. Therefore the claims contain new matter.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 73-84 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claims 73 and 79 were amended by the amendment of March 19, 2009 to provide that the pins are formed by filling the cooling holes with liquid elastic body "while adjusting an amount of the liquid elastic body in the cooling holes so that the liquid elastic body is reduced in volume with hardening thereof". This is confusing as to what is actually intended, because as discussed in the 35 USC 112, first paragraph rejection above, the specification describes a process where the amount of liquid elastic body in the cooling holes is adjusted during application so that the resulting masking pin does not protrude due to the inherent shrinkage of the elastic material used during hardening. However, the specification does not disclose what applicant actually claims--that the adjusting of the amount of liquid in the cooling holes results in the liquid elastic body being reduced in volume; because as described there would be some degree of shrinking during hardening for any amount provided. As claimed, applicant seems to be saying that the adjusting the amount causes reduction in volume during the hardening. For the purpose of examination, therefore, the Examiner has treated the claim as requiring either (1) that the adjustment of the liquid occurs, with in the liquid

being reduced in volume during hardening; or (2) the adjustment of the liquid being so as to control that the resulting masking pin does not protrude as claimed.

Claim 74, lines 1-2, claims that "said cooling holes are not drilled through". This is confusing as worded because it is unclear when the coating holes would be drilled through – before coating, after coating, etc. For the purpose of examination, the Examiner has treated the claim as providing that the timing can occur anywhere in the process, i.e. "not drilled through before coating" or "not drilled through after coating", for example.

Claim 80, lines 1-2, claims that "said cooling holes are not drilled through". This is confusing as worded because it is unclear when the coating holes would be drilled through – before coating, after coating, etc. For the purpose of examination, the Examiner has treated the claim as providing that the timing can occur anywhere in the process, i.e. "not drilled through before coating" or "not drilled through after coating", for example.

6. In the amendment of March 19, 2009, applicant argues that in the claims it would be clear that the cooling holes are not drilled through an entirety of the component "during the method of forming the thermal barrier coating" provided by claims 73 and 79. The Examiner has reviewed this argument, however, she disagrees. As worded, the claims could have been "drilled" partially through the component to make the holes before the coating process, since holes must be provided by some method or "drilled"

partially through the component to reopen holes after the thermal barrier coating is worded, as well as not drilled during the actual coating process. Therefore the claims themselves need to be clarified. And, applicant has not clarified where support for their position as to the drilling time is provided in the disclosure as originally filed.

### *Double Patenting*

7. Claim 84 is no longer considered a substantial duplicate of claim 78, as in the amendment of March 19, 2009, claim 84 now depends from claim 79, rather than claim 73 as claim 78 does.

### *Claim Rejections - 35 USC § 102*

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

### *Claim Rejections - 35 USC § 103*

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 73, 74, 76, 77, 79, 80 and 82-83 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Clingman et al (US 5130163), as evidenced by "GE Silicones RTV 11" Data Sheet (hereinafter RTV 11 Sheet).

Claims 73, 79: Clingman teaches a method of forming a thermal barrier coating by spray coating over a surface of a component. Column 1, lines 35-60. The component has cooling holes (perforations) made in it. Figure 2 and column 2, lines 15-50 (see perforations 22, for example). A masking process where masking plugs (pins) are inserted into the cooling holes is provided. Column 2, lines 55 through column 3, line 20. Silicone rubber, in a viscous spreadable state is applied and forced into the holes, and then dried and hardened to an elastomeric body. Column 2, line 55 through column 3, line 20. The masking plug can thus be composed of silicone rubber. Column 2, lines 60-65. The rubber would be "elastic" as it is described as "elastomeric". Column 3, lines 10-20. The masking process includes forming the plugs so that they do not protrude above the surface of the component. Column 3, lines 1-11 and figure 4. Then blasting treatment process is provided where the surface of the component is blasted and coarsened (roughened) to prepare the surface for coating. Column 3, lines 20-30. Then a spray coating process is provided where a thermal barrier coating is formed by spray



coating over the surface of the coarsened component. Column 3, lines 30-65 and column 1, lines 35-45.

As to filling the holes with "liquid elastic body" and the adjusting an amount of the liquid elastic body in the cooling holes so that the liquid elastic body is reduced in volume with hardening thereof, Clingman teaches that the exemplary silicone rubber that is used is RTV-11 from General Electric (column 2, lines 60-65) and that it is applied and cured (column 3, lines 10-20). RTV 11 Sheet indicates that the cured RTV 11 has a shrinkage of 0.6 %. Page 2. RTV 11 Sheet also indicates that the material is easily pourable in consistency. Page 2.

Therefore, (a) As to the 35 USC 102(b) rejection – Since Clingman teaches the use of a flowable, spreadable silicone rubber sealant of RTV 11; and RTV 11 is inherently understood to be easily pourable, one of ordinary skill in the art would understand that the state of the silicone rubber used in Clingman is a "liquid". Furthermore, since Clingman teaches to adjust the amount of silicone rubber RTV 11 in the cooling holes (by the wiping or squeegeeing, column 3, lines 1-10) and curing and hardening the final amount (column 3, lines 10-20) and RTV 11 will inherently shrink during cure, the claimed requirement of adjusting the amount of liquid elastic body in the cooling holes so that the liquid elastic body is reduced in volume with hardening thereof occurs; since adjusting occurs and the provided amount will shrink.

(b) As to the 35 USC 103 rejection – Even if the flowable, spreadable silicone rubber sealant of Clingman is not understood to inherently be a liquid, the

teaching of Clingman of using a flowable, spreadable material would at least suggest that the material be in the form of a liquid, as the broad teaching of flowable, spreadable material would be inclusive of liquid. Furthermore, as to the adjusting of the amount of the liquid elastic, if this is to be adjusted based on the shrinkage of the liquid elastic during curing, Clingman would suggest this as well, since Clingman provides adjusting the maskant to a desired position and height of the RTV 11 maskant (column 3, lines 5-10) and as shown by RTV 11 sheet, the RTV 11 maskant has a known shrinkage amount, or at the least would be expected to shrink at least some degree, during curing, and one of ordinary skill in the art would clearly take this known or expected shrinkage amount into consideration when applying the material so that a desired amount of coverage occurs so that what is desired to be masked is actually masked.

Claims 74, 80: the cooling holes are not “drilled through” as the holes do not extend all the way through the component, for example. Column 2, lines 15-50 and figure 2 (shrouded side perforations 18 are offset relative to perforations 22). As well, drilling through does not occur after coating, as the plugs are removed by thermal/chemical treatment or chemical treatment rather than drilling. Column 4, lines 25-60.

Claims 76, 82: Clingman teaches that the material of the masking pin is elastic and resistant to blasting (column 3, lines 25-30), is resistant to the heat caused by the spray coating (as the plug remains after thermal spray coating and must be removed, column 4, lines 25-35), has stripping easiness as it can be entirely removed after coating

(as the plug is stripped out, and as the air flow remains the same after the treatment, column 5, lines 1-10), and as to adherence and wetness to prevent thermal barrier coating material from accumulation, teaches that the bond coat and top coat do not readily adhere to the plug material and almost all particles do not adhere (column 3, lines 45-55 and column 4, lines 1-6).

Claims 77, 83: the masking plug can be composed of silicone rubber. Column 2, lines 60-65. The rubber would be "elastic" as it is described as "elastomeric". Column 3, lines 10-20.

11. Claims 75 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clingman, as evidenced by RTV 11 Sheet, as applied to claims 73, 74, 76, 77, 79, 80 and 82-83 above, and further in view of the admitted state of the prior art.

Clingman, as evidenced by RTV 11 Sheet, teaches all the features of these claims except that the component is specifically a combustion transition piece. Clingman does teach that the component is to be used in a gas turbine engine combustor, for example. Column 2, lines 20-25. The cooling holes and the coating can be provided in an internal periphery surface of the component. Column 1, lines 35-60 and column 2, lines 30-35 (the inside lamina 12 is the exposed surface to be treated).

The admitted state of the prior art, at pages 1-3 of the specification, teaches that combustion transition pieces (103) are well known parts of a combustor in a gas turbine

with cooling holes which are to be coated with thermal barrier coatings (with masking of the holes) on an internal periphery surface of a wall.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Clingman, as evidenced by RTV 11 Sheet, to use a combustion transition piece as the substrate component to be spray coated on the internal periphery as suggested by the admitted state of the prior art, with an expectation of providing desirable protected surfaces because Clingman, as evidenced by RTV 11 Sheet, teaches to provide thermal barrier coatings on internal periphery of components to be used in a gas turbine engine combustor, and the admitted state of the prior art teaches that a conventional part of a combustor in a gas turbine that contains cooling holes to be treated on an internal periphery with thermal barrier coating is a combustion transition piece.

12. Claims 78 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clingman, as evidenced by RTV 11 Sheet as applied to claims 73, 74, 76, 77, 79, 80 and 82-83 above, and further in view of Kang et al (US 5800695).

Clingman, as evidence by RTV 11 Sheet, teaches all the features of these claims except that liquid silicone rubber is injected into the cooling hole before hardening the rubber (claims 78, 84).

Kang teaches providing maskant into cooling holes in a gas turbine engine component. Column 1, lines 1-10. The maskant is provided into the holes by injecting

into the cooling holes in a liquid state, and then cured to harden. Column 2, lines 15-45. The maskant is filled into the cooling holes so that the maskant is flush with the surface of the component. Column 2, lines 25-30. Kang teaches that when injecting the maskant, care should be taken that the maskant is not present on surfaces intended to be coated. Column 2, lines 39-40 and figure 4. Kang further teaches to remove any maskant that is present on the outside of the component. Column 2, lines 40-41.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Clingman, as evidenced by RTV 11 Sheet, to inject the maskant in a liquid state as suggested by Kang, with an expectation of providing desirable protected surfaces because Clingman, as evidenced by RTV 11 Sheet, suggests to provide the silicone rubber maskant in a liquid state and force it into the holes followed by curing and hardening, and Kang teaches that a conventional desirable way to force maskant into cooling holes is to inject it in a liquid form and then cure to harden.

13. Montierth (US 4411856) teaches that when making masking members using silicones that care should be taken to account for any shrinkage which occurs in the fabrication of the mask. Column 8, lines 5-35 and 55-60, for example.

### *Response to Arguments*

14. Applicant's arguments with respect to claims 73-84 have been considered but are moot in view of the new ground(s) of rejection.

The Examiner has provided the RTV 11 Sheet cited above to clarify why Clingman would indicate to provide a material that shrinks and to adjust application based on this shrinkage. The Examiner notes that while no copyright or publishing date is provided for the RTV 11 Sheet, as noted in MPEP 2124, "In certain circumstances, references cited to show a universal fact need not be available as prior art before applicant's filing date. In re Wilson, 311 F.2d 266, 135 USPQ 442 (CCPA 1962). Such facts include the characteristics and properties of a material or a scientific truism." (emphasis added). The Examiner notes that as to the 35 USC 102(b) rejection, as discussed in MPEP 2131.01(III) a further, evidentiary reference can be provided to show that a characteristic not disclosed in the reference is inherent (here to show characteristics of RTV 11).

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine A. Bareford/  
Primary Examiner, Art Unit 1792